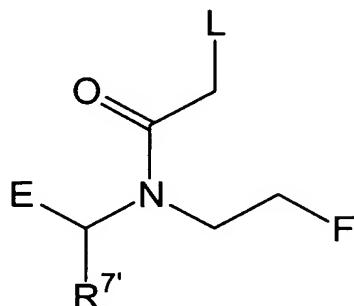


This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-7 (canceled)

8 (currently amended). The compound of claim 34 4 having the formula:



wherein:

L is selected from the group consisting of the nucleobases thymine, adenine, cytosine, quanine, uracil, 5-methylcytosine, 6-thioquanine, 7-deazaguanine, 7-deaza-8-azaguanine, 2,6-diaminopurine, 5-bromouracil, and protected derivatives; thereof:

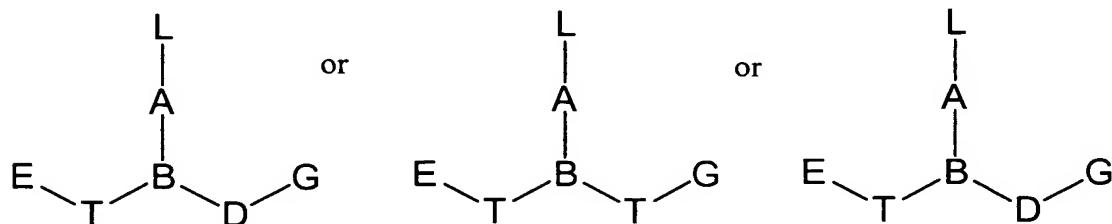
R^{7'} is hydrogen;

E is SO₂OH or SO₂OH COOH or an activated or protected derivative thereof; and

F is NH₂ or NHPg, where Pg is an amino protecting group.

9-33 (canceled)

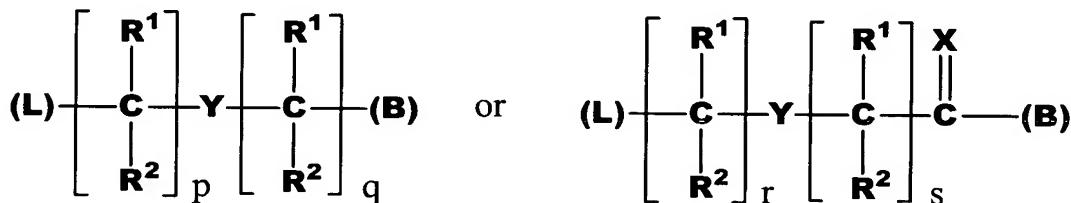
34 (new). A compound having one of the following formulas:



wherein:

L is a naturally occurring nucleobase, a non-naturally occurring nucleobase, a DNA intercalator, or a nucleobase binding group, and amino groups are, optionally protected by amino protecting groups;

A is a single bond or a group of the formula:



where:

X is O, S, Se, NR³, CH₂ or C(CH₃)₂;

Y is: a single bond, O or S when s is zero; or

a single bond, O, S or NR⁴ when s is an integer from 1 to 5;

each of p and q is zero or an integer from 1 to 5, the sum of p+q being not more than 10;

each of r and s is zero or an integer from 1 to 5, the sum of r+s being not more than 10;

each R¹ and R² is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl, hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio, amino and halogen; and

each R³ and R⁴ is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl, hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio and amino;

B is N or R³N⁺, where R³ is defined above;

each T is CR⁶R⁷, CHR⁶CHR⁷ or CR⁶R⁷CH₂, wherein R⁶ is hydrogen and R⁷ is selected from the group consisting of the side chains of naturally occurring alpha amino acids other than lysine, or R⁶ and R⁷ are independently selected from the group consisting of hydrogen, (C₂-C₆)alkyl, aryl, aralkyl, heteroaryl, hydroxy, (C₁-C₆)alkoxy, (C₁-C₆)alkylthio, NR³R⁴ and SR⁵, where R³ and R⁴ are as defined above, and R⁵ is hydrogen or (C₁-C₆)alkyl, hydroxy-, alkoxy-, or alkylthio- substituted (C₁-C₆)alkyl, or R⁶ and R⁷ taken together complete an alicyclic or heterocyclic system;

D is CR⁶R⁷, CH₂CR⁶R⁷ or CHR⁶CHR⁷, where R⁶ and R⁷ are as defined above;

each E is, independently SOOH or SO₂OH, or an activated or protected derivative thereof; and

each G is, independently, NHR³ or NPgR³, where R³ is as defined above, and Pg is an amino protecting group.

35 (new). The compound of claim 34 wherein L is a naturally occurring nucleobase or a non-naturally occurring nucleobase.

36 (new). The compound of claim 8, wherein Pg is tertbutyloxycarbonyl or 9-fluorenylmethoxycarbonyl.

37 (new). The compound of claim 8, wherein L is thymine.

38 (new). The compound of claim 37, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

39 (new). The compound of claim 8, wherein L is adenine or a protected derivative thereof.

40 (new). The compound of claim 39, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

41 (new). The compound of claim 40, wherein Pg is tert-butoxonyl and adenine is protected with a benzyloxycarbonyl protecting group.

42 (new). The compound of claim 8, wherein L is cytosine or a protected derivative thereof.

43 (new). The compound of claim 42, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

44 (new). The compound of claim 8, wherein L is guanine or a protected derivative thereof.

45 (new). The compound of claim 44, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenyl-methoxycarbonyl.

46 (new). The compound of claim 8, wherein L is uracil.

47 (new). The compound of claim 46, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenyl-methoxycarbonyl.

48 (new). The compound of claim 8, wherein L is 5-methylcytosine or a protected derivative thereof.

49 (new). The compound of claim 48, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenyl-methoxycarbonyl.

50 (new). The compound of claim 8, wherein L is 6-thioguanine or a protected derivative thereof.

51 (new). The compound of claim 50, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenyl-methoxycarbonyl.

52 (new). The compound of claim 8, wherein L is 7-deazaguanine or a protected derivative thereof.

53 (new). The compound of claim 52, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenyl-methoxycarbonyl.

54 (new). The compound of claim 8, wherein L is 7-deaza,8-azaguanine or a protected derivative thereof.

55 (new). The compound of claim 54, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

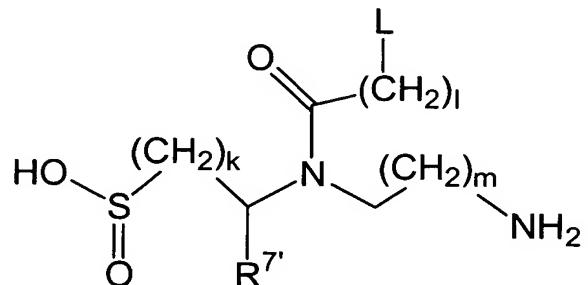
56 (new). The compound of claim 8, wherein L is 2,6-diaminopurine or a protected derivative thereof.

57 (new). The compound of claim 56, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

58 (new). The compound of claim 8, wherein L is 5-bromouracil.

59 (new). The compound of claim 58, wherein Pg is *tert*-butoxycarbonyl or 9-fluorenylmethoxycarbonyl.

60 (new). The compound of claim 34 having the formula:



wherein:

L is selected from the group consisting of heterocyclic moieties, naturally occurring nucleobases, and non-naturally occurring nucleobases;

R^7' is selected from the group consisting of hydrogen and the side chains of naturally occurring alpha amino acids other than lysine;

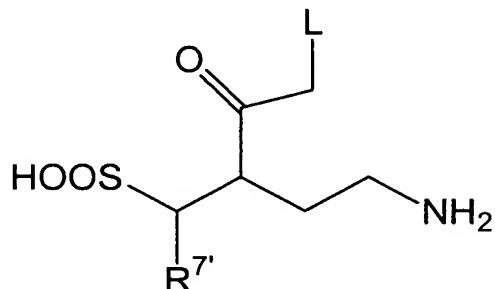
k is zero or an integer from 1 to 5; and

m and l are, independently, zero or 1.

61 (new). The compound of claim 60, wherein R^7' is hydrogen.

62 (new). The compound of claim 61, wherein L is a naturally occurring nucleobase or a non-naturally occurring nucleobase.

63 (new). A monomer synthon having the formula:



wherein R^{7'} is selected from the group consisting of hydrogen and the side chains of naturally occurring amino acids other than lysine and L is selected from the group consisting of thymine, adenine, cytosine, guanine and uracil, and said monomer synthon having one of amino-protection, acid terminal activation or both amino protection and acid terminal activation.

64 (new). The monomer synthon of claim 63, wherein L is adenine or a protected derivative thereof.

65 (new). The monomer synthon of claim 63, wherein L is guanine or a protected derivative thereof.

66 (new). The monomer synthon of claim 63, wherein L is thymine.

67 (new). The monomer synthon of claim 63, wherein L is cytosine or a protected derivative thereof.

68 (new). The monomer synthon of claim 63, wherein L is uracil.

69 (new). The monomer synthon of claim 63, wherein R^{7'} is hydrogen.

70 (new). The monomer synthon of claim 63, wherein R⁷ is the side chain of a naturally occurring alpha amino acid other than lysine.

71 (new). The monomer synthon of claim 69, wherein L is adenine or a protected derivative thereof.

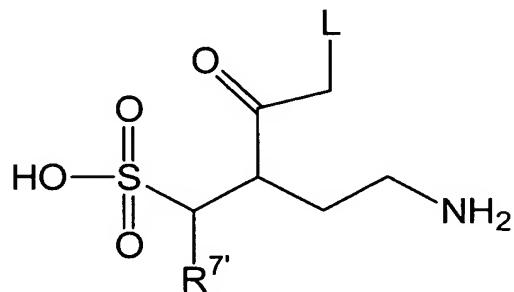
72 (new). The monomer synthon of claim 69, wherein L is guanine or a protected derivative thereof.

73 (new). The monomer synthon of claim 69, wherein L is thymine.

74 (new). The monomer synthon of claim 69, wherein L is cytosine or a protected derivative thereof.

75 (new). The monomer synthon of claim 69, wherein L is uracil.

76 (new). A monomer synthon having the formula:



wherein R⁷' is selected from the group consisting of hydrogen and the side chains of naturally occurring amino acids other than lysine and L is selected from the group consisting of thymine, adenine, cytosine, guanine and uracil, and said monomer synthon having one of amino-protection, acid terminal activation or both amino protection and acid terminal activation.

77 (new). The monomer synthon of claim 76, wherein L is adenine or a protected derivative thereof.

78 (new). The monomer synthon of claim 76, wherein L is guanine or a protected derivative thereof.

79 (new). The monomer synthon of claim 76, wherein L is thymine.

80 (new). The monomer synthon of claim 76, wherein L is cytosine or a protected derivative thereof.

81 (new). The monomer synthon of claim 76, wherein L is uracil.

82 (new). The monomer synthon of claim 76, wherein R⁷ is hydrogen.

83 (new). The monomer synthon of claim 76, wherein R⁷ is the side chain of a naturally occurring alpha amino acid other than lysine.

84 (new). The monomer synthon of claim 82, wherein L is adenine or a protected derivative thereof.

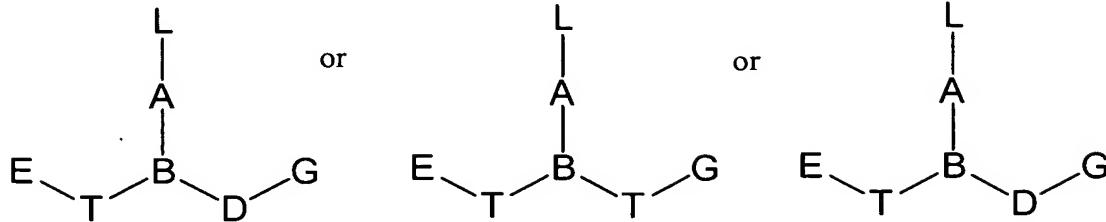
85 (new). The monomer synthon of claim 82, wherein L is guanine or a protected derivative thereof.

86 (new). The monomer synthon of claim 82, wherein L is thymine.

87 (new). The monomer synthon of claim 82, wherein L is cytosine or a protected derivative thereof.

88 (new). The monomer synthon of claim 82, wherein L is uracil.

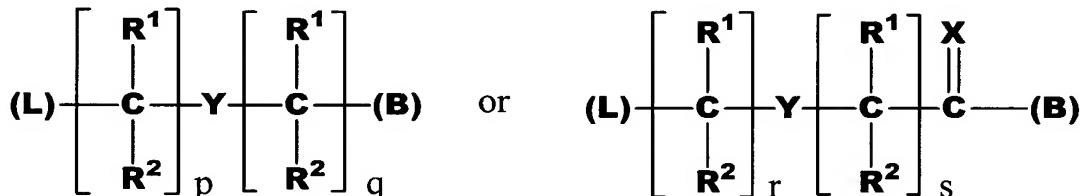
89 (new). A compound having one of the following formulas:



wherein:

L is a purine nucleobase and amino groups are, optionally protected by amino protecting groups;

A is a single bond or a group of the formula:



where:

X is O, S, Se, NR³, CH₂ or C(CH₃)₂;

Y is: a single bond, O or S when s is zero; or

a single bond, O, S or NR⁴ when s is an integer from 1 to 5;

each of p and q is zero or an integer from 1 to 5, the sum of p+q being not more than 10;

each of r and s is zero or an integer from 1 to 5, the sum of r+s being not more than 10;

each R¹ and R² is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl, hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio, amino and halogen; and

each R³ and R⁴ is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl; hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio and amino;

B is N or R³N⁺, where R³ is defined above;

each T is CR^6R^7 , CHR^6CHR^7 or $CR^6R^7CH_2$, wherein R^6 is hydrogen and R^7 is selected from the group consisting of the side chains of naturally occurring alpha amino acids other than lysine, or R^6 and R^7 are independently selected from the group consisting of hydrogen, $(C_2-C_6)alkyl$, aryl, aralkyl, heteroaryl, hydroxy, $(C_1-C_6)alkoxy$, $(C_1-C_6)alkylthio$, NR^3R^4 and SR^5 , where R^3 and R^4 are as defined above, and R^5 is hydrogen or $(C_1-C_6)alkyl$, hydroxy-, alkoxy-, or alkylthio- substituted $(C_1-C_6)alkyl$, or R^6 and R^7 taken together complete an alicyclic or heterocyclic system;

D is CR^6R^7 , $CH_2CR^6R^7$ or CHR^6CHR^7 , where R^6 and R^7 are as defined above;

each E is, independently SOOH or SO_2OH , or an activated or protected derivative thereof; and

each G is, independently, NHR^3 or $NPgR^3$, where R^3 is as defined above, and Pg is an amino protecting group.

90 (new). The compound of claim 89, wherein L is adenine or a protected derivative thereof.

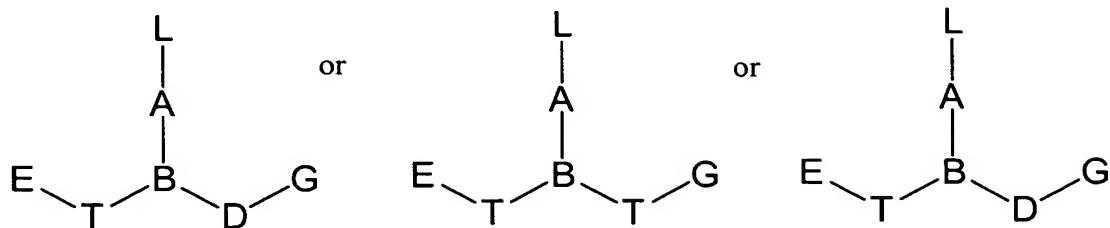
91 (new). The compound of claim 89, wherein L is guanine or a protected derivative thereof.

92 (new). The compound of claim 89, wherein L is 6-thioguanine or a protected derivative thereof.

93 (new). The compound of claim 89, wherein L is 7-deazaguanine or a protected derivative thereof.

94 (new). The compound of claim 89, wherein L is 7-deaza,8-azaguanine or a protected derivative thereof.

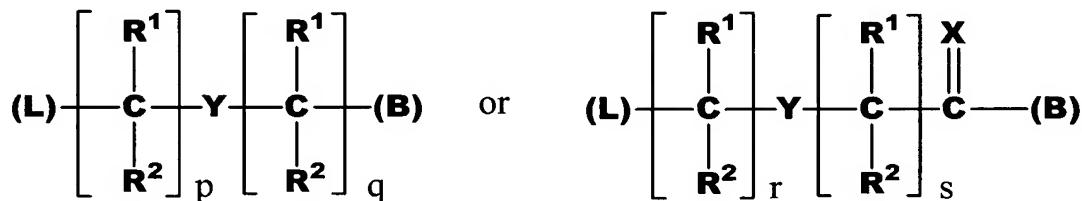
95 (new). A compound having one of the following formulas:



wherein:

L is a pyrimidine nucleobase and amino groups are, optionally protected by amino protecting groups;

A is a single bond or a group of the formula:



where:

X is O, S, Se, NR³, CH₂ or C(CH₃)₂;

Y is: a single bond, O or S when s is zero; or

a single bond, O, S or NR⁴ when s is an integer from 1 to 5;

each of p and q is zero or an integer from 1 to 5, the sum of p+q being not more than 10;

each of r and s is zero or an integer from 1 to 5, the sum of r+s being not more than 10;

each R¹ and R² is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl, hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio, amino and halogen; and

each R³ and R⁴ is independently selected from the group consisting of hydrogen, (C₁-C₄)alkyl, hydroxy- or alkoxy- or alkylthio-substituted (C₁-C₄)alkyl, hydroxy, alkoxy, alkylthio and amino;

B is N or R³N⁺, where R³ is defined above;

each T is CR⁶R⁷, CHR⁶CHR⁷ or CR⁶R⁷CH₂, wherein R⁶ is hydrogen and R⁷ is selected from the group consisting of the side chains of naturally occurring alpha amino acids other than lysine, or R⁶ and R⁷ are independently selected from the group

consisting of hydrogen, (C₂-C₆)alkyl, aryl, aralkyl, heteroaryl, hydroxy, (C₁-C₆)alkoxy, (C₁-C₆)alkylthio, NR³R⁴ and SR⁵, where R³ and R⁴ are as defined above, and R⁵ is hydrogen or (C₁-C₆)alkyl, hydroxy-, alkoxy-, or alkylthio- substituted (C₁-C₆)alkyl, or R⁶ and R⁷ taken together complete an alicyclic or heterocyclic system;

D is CR⁶R⁷, CH₂CR⁶R⁷ or CHR⁶CHR⁷, where R⁶ and R⁷ are as defined above;

each E is, independently SOOH or SO₂OH, or an activated or protected derivative thereof; and

each G is, independently, NHR³ or NPgR³, where R³ is as defined above, and Pg is an amino protecting group.

96 (new). The compound of claim 95, wherein L is thymine.

97 (new). The compound of claim 95 wherein L is cytosine of a protected derivative thereof.

98 (new). The compound of claim 95, wherein L is uracil.

99 (new). The compound of claim 95, wherein L is 5-methylcytosine or a protected derivative thereof.

100 (new). The compound of claim 95, wherein L is 5-bromouracil.